The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304-1148

January 28, 2011
In reply refer to: SHEA-110828

Mr. Paul Ruffin
Hazardous Substance Engineer
Department of Toxic Substances Control
8800 Cal Center Drive
Sacramento, CA 95826-3200

Re: Revised Closure Plans for Ground Water Treatment Units
The Boeing Company
Santa Susana Field Laboratory

Dear Mr. Ruffin:

Enclosed are two separate, revised closure plans for eight (8) ground water treatment units (GWTUs) located at the Santa Susan Field Laboratory. One revised closure plan represents the closure of five (5) GWTUs owned and operated by The Boeing Company (Boeing). The second revised closure plan represents the closure of three (3) GWTUs owned by the National Aeronautics and Space Administration (NASA) and operated by Boeing.

Two hard copies and one electronic copy of each closure plan are being included in this submittal. Hard copies and an electronic copy of these closure plans are being submitted to Ms. Yvette LaDuke in the Department of Toxic Substances Control's Chatsworth Office under separate cover.

These closure plans represent the revisions that were made to the 1995 closure plans which were approved by the Department of Toxic Substance Control (DTSC) as part of the issuance of Boeing's and NASA's 1995 Post-Closure Permits. The revisions were necessary to address current requirements for closure, as well as written comments provided by DTSC in Mark Malinowski's letter date January 6, 2011. A summary of DTSC's comments and how they were addressed is provided as Attachment 1 to this letter.

The revisions to the 1995 closure plans are being requested as Class I modifications to Boeing's and NASA's Post Closure Permits. Pursuant to your request to Mike Lispi of Haley & Aldrich, Inc., comparisons of the revisions to Boeing's and NASA's 1995 closure plans are provided as Attachments 2 & 3, respectively, to assist DTSC with this determination.

Please contact me at (818) 466-8795 if you have any comment or questions concerning the closure plans.

Sincerely,

Art Lenox
The Boeing Company

Attachments

Cc w/o closure plans:

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Mr. Mark Malinowski, P.E.
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Attachment 1 – Responses to DTSC Comments on SSFL Groundwater Treatment Unit Closure Plans

GENERAL COMMENTS			
No.	DTSC Comment	Response	Comments
1	The March 2010 permit modification notifications were submitted for Class 1* modifications. The classification of permit modifications are listed in Appendix I to California Code of Regulations, title 22, division 4.5, chapter 20 and additional requirements are provided in California Code of Regulations, title 22, section 66270.42, subsection (d) (22 CCR 66270.42(d)). If the proposed closure plan changes are not explicitly listed in Appendix I, Boeing and NASA may request a determination of the classification pursuant to 22 CCR 66270.42(d).	The modifications appear to be Class I modifications (see Comments)	Appendix I: **A. General Permit Provisions** 4. Changes in the frequency of or procedures for monitoring, reporting, sampling, or maintenance activities by the permittee: a. To provide for more frequent monitoring, reporting, sampling, or maintenance. And **D. Closure** 1. Changes to the closure plan: b. Changes in the closure schedule for any unit, changes in the final closure schedule for the facility, or extension of the closure period, with prior approval of the Department.
2	Submittal of closure plans from the 2006 permit applications and 2007 permit modifications may be confusing to the public. I recommend that the revised closure plans for the Boeing and NASA PC Permit modifications should either be direct replacements for the closure plans in the "Groundwater Remediation Operation Plan" or stand alone	Closure Plans are being revised to be Stand-Alone documents.	

	documents with a current date.		
3	The closure plans must cover all of the tank system, including the associated ancillary equipment, from the hazardous waste point of generation through the treatment tanks to a point of disposal onsite, or to a point of shipment for disposal offsite. The GWTU closure plans do not include the piping from the groundwater extraction wells to the treatment units and any effluent piping.	Piping has been addressed in the current revision to include one sample to the inlet of each treatment unit trunk line (8 samples total).	Approx. 15,000 lf of piping. Per Paul Ruffin proposed sample frequency of one sample per 1000 feet may be higher than needed to characterize the pipe. Addressed in Section 6 - Initiating Closure
4	Surface samples must be taken to confirm that equipment and structures have not been or are no longer contaminated with hazardous constituents. Rinse water sampling alone is not recommended for measuring decontamination of tanks, since it is not conclusive evidence that hazardous constituents have been removed. However, rinse water from components such as pumps, piping, and filters, where wipe sample locations are inaccessible may be used to determine decontamination. Wipe samples are applicable to smooth and impervious solid surfaces. Chip sampling is recommended for porous surfaces, such as uncoated concrete, asphalt and wood.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed. Wipe sampling and chip sampling added to the revised closure plans.	Addressed in Section 6 – Initiating Closure

5	The closure plans propose recirculating rinse water in operational treatment units. Considering the time these units have been idle, there may be difficulties restoring them to operational status. It may be more straightforward to dismantle the treatment units and decontaminate the parts.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	
6	The maximum inventory evaluations are incorrect. The maximum inventory would be if the GWTU was abandoned with the entire tank system capacity containing waste, including any reagent chemicals and generator accumulation areas. DTSC recognizes that this hypothetical maximum inventory, which is primarily used for the closure cost estimate, may not match the actual condition of the unit prior to closure. The summaries of anticipated quantities of wastes that will be generated during closure activities are incomplete and inadequate.	Agreed. SHMP tanks at ASTs and H2O2 tanks at Uv/Peroxide units to be included. Two poly tanks of contaminated water at WS09 treatment unit have been added.	The inventory of these tanks is addressed in Section 5 - Maximum Inventory and Section 9 - Waste Management Plan. .
7	The closure plans do not specifically address removal and analysis of sediments/ sludges from tanks/sumps or removal of the AST packing.	Management of sludge and packing material added.	These materials are addressed in Section 6 - Initiating Closure and Section 9 - Waste Management Plan.

8	The closure plans discuss moving sodium hexametaphosphate and hydrogen peroxide that remains at the time closure activities are initiated to the active treatment units (Delta and WS-05) where it will be used. What is the inventory of sodium hexametaphosphate and hydrogen peroxide at the GWTUs?	This discussion has been removed from the closure plans	The SHMP and H2O2 inventories have been included in Section 9 - Waste Management Plan.
9	The proposed soil sample locations, under the central portions of the containment slabs, are probably the least likely locations to discover a release. Add sample locations along the perimeter of the containment, at or near sumps, and at any identified cracks through the containment. Alternatively, collect soil samples after the containment pads have been removed.	Revised soil sampling plan includes this sampling.	These revisions are included in Section 7 Sampling Plan.
10	Soil samples for VOCs analysis should be collected using methods that minimize soil disturbance and are consistent with EPA Method 5035. Use of hand trowels and hand augers may not be appropriate.	Revised to use direct push and encore or similar sampling.	These revisions are included in Section 7 Sampling Plan.

Specific Comments			
No.	DTSC Comment	Response	Notes
Boeing PC Permit			
11	Page 4 lists the groundwater treatment facilities in Areas I and III. The list includes the ECL Collection Unit in Area III. Is the ECL Collection Unit the same as the ECL Collection System discussed in the description of the STL-IV Air Stripping System on page 5? Does Boeing intend to close the ECL Collection Unit at the same time as the five GWTUs in Areas I and III?	The ECL Collection System does not require closure.	The ECL collection system is a "point of generation" for collecting groundwater similar to the other wells. Groundwater from this collection system was pumped into a truck and transported to the treatment system.
Areas I and III Closure Plan			
12	Section 4., Hazardous Waste Constituents, lists wastes codes that applied or may have potentially applied to the waste stream treated in the GWTUs, but does not list chemical compounds (except trichloroethylene and hydrazine). Section 4 is referenced in Section 8 as constituents for analysis and in Section 10 as a list of analytes for the performance standard. It is not clear how the list of waste codes in Section 4 will function in	Section 4 has been revised.	The specific chemicals associated with the waste codes have been added to Section 4 – Hazardous Waste Constituents. Section 8 – Analytical Procedures has been revised to correlate the specific test methods appropriate for analyses of these chemicals.

	closure plan Sections 8 and 10.		
13	Section 5.2, Page 15, 3rd Bullet refers to carbon canisters associated with the Bravo treatment unit, which is Area II.	Corrected	
14	Section 6.3.2. It is not clear why flushing treated effluent through the system is "after the equipment exteriors and the concrete slab have been decontaminated." This may be a "carry over" from earlier closure plans which treated the exterior and concrete slab rinse water in the treatment system.	Removed from the Closure Plan	
15	Section 8. Please explain how the analytical methods list in Table 3 is adequate for hazardous waste characterization.	Revised	Revisions are included in Section 8 - Analytical Procedures.
16	Section 8.1. The numbers of external and internal rinse water samples are not specified in the text. Table 4, Closure Cost Estimate, section 1.2.1, indicates 5 samples per treatment unit, but the cost estimate column "Amount or Number" indicates 4 samples per unit. This may not be sufficient if multiple efforts are	Deleted from Closure Plan	

	required to adequately decontaminate the external or internal treatment unit surfaces.		
17	Section 9.1. It is not clear why the analyses specified for soil samples are different between the first and second paragraphs.	Revised	Revisions are included in Section 8 - Analytical Procedures.
18	Section 10.1. Decontamination of the treatment unit is considered successful if the rinse water circulating in the operating treatment unit is not a hazardous waste. This is clearly not an appropriate performance standard for decontamination of surfaces. See General Comment 4.	Removed from the Closure Plan	
19	Section 10.3. This section clarifies that for the primary performance standard soil samples will be analyzed for the organic compounds under the hazardous waste codes, identified in Section 4, for which the treatment unit was permitted to treat. Only the waste codes F001, F002, and F005 listed in Section 4 have identified organic hazardous	Revised	Revisions included in Section 9 - Waste Management Plan and Section 10 - Performance Standards.

	constituents. Waste codes 211 and 213 list some chemical compounds as examples for the waste description, but a complete list of hazardous constituents is not provided. It is not clear why "non-detect" is identified as a Primary Performance Standard if health risk assessment will be applied to any detected organic constituent. The soil analyses and performance standards are only discussed for organic constituents. There are no performance standards for inorganic constituents.		
20	Section 10.3 proposes a risk assessment for organic constituents in soil and an iterative process of removal and subsequent risk assessments until the risk endpoints are within an acceptable range. The description of this closure by removal process is wholly inadequate.	Revised	Revisions included Section 10 - Performance Standards.
21	Section 11, Closure Cost Estimate. The cost estimates are incomplete and inadequate. DTSC typically	Revised	Revisions included in Section 11 - Cost Estimate and Financial Assurance.

	uses Cost-Pro or RACER cost estimating programs to evaluate closure cost estimates. However, because the implementation of closure is imminent, a detailed closure cost estimate is not essential.		
22	The sections for Closure Cost Estimate and Financial Responsibility are both Numbered "11."	Revised	Both have been combined in Section 11 - Cost Estimate and Financial Assurance.
23	Table 1, Maximum Inventory, indicates 15,000 gallons of decontamination rinse water per unit. However, Table 4, Closure Cost Estimate, line 1.2.2, indicates only 1 unit with 15,000 gallons of rinse water, instead of 4 units.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	
24	Table 4, Closure Cost Estimate, line 1.2.1, indicated 5 samples per treatment unit, but costs are only provided for 4 samples per unit. Line 3.2 provides for only 18 samples of soil and concrete per unit, which provides three samples at each of six locations. So either the concrete core sample or the 24"-30" depth soil sample is not included in the cost estimate.	Revised	Revisions included in Section 7 - Sampling Plan and Section 11 - Cost Estimate and Financial Assurance.

Area II Closure Plan			
25	The Executive Summary, Introduction, first bullet, says 2 sets of four air stripping towers (ASTs) at the Bravo Test Area. There are 2 sets of two ASTs for a total of four ASTs.	Revised	Revisions included in the Executive Summary and Section 9 - Waste Management Plan.
26	Section 4., Hazardous Waste Constituents, lists wastes codes that applied or may have potentially applied to the waste stream treated in the GWTUs, but does not list chemical compounds (except trichloroethylene and hydrazine). Section 4 is referenced in Section 8 as constituents for analysis and in Section 10 as a list of analytes for the performance standard. It is not clear how the list of waste codes in Section 4 will function in closure plan Sections 8 and 10.	Revised.	The specific chemicals associated with the waste codes have been added to Section 4 – Hazardous Waste Constituents. Section 8 - Analytical Procedures has been revised to correlate the specific test methods appropriate for analyses of these chemicals.
27	Sections 6.3.1.2. and 6.3.2.2. It is not clear why flushing treated effluent through the system is "after the equipment exteriors and the concrete slab have been decontaminated." This may be a "carry over" from a prior closure plan which treated the exterior	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	

	and concrete slab rinse water in the treatment system.		
28	Section 6.3.2.3 indicates that after the decontamination of the RD-09 treatment unit interior is completed, the carbon canisters will be disconnected and removed from the treatment unit. Carbon canisters are not listed in the description of the RD-09 UV/Peroxidation Unit in Section 3.2.2.1.	Removed	Carbon was not used at RD-09
29	Section 10.3. This section clarifies that for the primary performance standard soil samples will be analyzed for the organic compounds under the hazardous waste codes, identified in Section 4, for which the treatment unit was permitted to treat. Only the waste codes F001, F002, and F005 listed in Section 4 have identified organic hazardous constituents. Waste codes 211 and 213 list some chemical compounds as examples for the waste description, but a complete list of hazardous constituents is not provided. It is not clear why "non-detect" is identified as a	Revised	Revisions included in Section 9 - Waste Management Plan and Section 10 - Performance Standards.

	Primary Performance Standard if health risk assessment will be applied to any detected organic constituent. The soil analyses and performance standards are only discussed for organic constituents. There are no performance standards for inorganic constituents.		
30	Section 10.3 proposes a risk assessment for organic constituents in soil and an iterative process of removal and subsequent risk assessments until the risk endpoints are within an acceptable range. The description of this closure by removal process is wholly inadequate.	Revised	Revisions included Section 10 - Performance Standards.
WS-05 Closure Plan			
31	The Closure Plan is inadequate and should be updated.	WS-05 included in revised CP for Areas I & III	
32	Section 2. The closure plan must include any influent/effluent tanks.	Revised	One effluent tank was associated with WS-09 and has been included in Section 5 - Maximum Inventory and Section 9 - Waste Management Plan
33	Section 3.2., Hazardous Waste Constituents, lists wastes codes that	Revised	Revisions included in Section 4 - Hazardous Waste Constituents and Section 8 - Analytical

	applied or may have potentially applied to the waste stream treated in the GWTU, but does not list chemical compounds (except TEC, cis 1,2-DCE, trans 1,2-DCE and hydrazine). Section 3 is referenced in Section 9 for organic compounds to be analyzed for the performance standard. It is not clear how the list of waste codes in Section 3 will function in closure plan Section 9.		Procedures
34	Section 6.3. The decontamination of the equipment interiors consists of continuously flushing treated effluent through the system for a minimum of two hours. There are no sampling, analysis or performance standards described for the decontamination.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	
35	Section 6.5. The management and disposal of rinse water treated in the treatment unit is not described.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	
36	Section 9. This section says that soil samples will be analyzed for the organic compounds under the hazardous waste codes, identified in Section 3, for which the treatment unit was permitted	Revised	Revisions included in Section 4 - Hazardous Waste Constituents and Section 8 - Analytical Procedures.

	to treat. Only the waste codes F001, F002, and F005 listed in Section 3 have identified organic hazardous constituents. Waste codes 211 and 213 list some chemical compounds as examples for the waste description, but a complete list of hazardous constituents is not provided. It is not clear why "non-detect" is identified as a Primary Performance Standard if health risk assessment will be applied to any detected organic constituent. The soil analyses and performance standards are only discussed for organic constituents. There are no performance standards for inorganic constituents.		
37	Section 9 proposes a risk assessment for organic constituents in soil and an iterative process of removal and subsequent risk assessments until the risk endpoints are within an acceptable range. The description of this closure by removal process is wholly inadequate.	Revised	Revisions included in Section 10 - Performance Standards

38	Section 10, Closure Cost Estimate. The cost estimate is incomplete and inadequate. DTSC typically uses Cost-Pro or RACER cost estimating programs to evaluate closure cost estimates. However, because the implementation of closure is imminent, a detailed closure cost estimate is not essential.	Revised	Revisions included in Section 11 - Cost Estimate and Financial Assurance.
Delta Closure Plan			
398	The Closure Plan is inadequate and should be updated.	Delta is included in revised Area II CP.	
40	Section 6.3. The decontamination of the equipment interiors consists of continuously flushing treated effluent through the system for a minimum of two hours. There are no sampling, analysis, or performance standards described for the decontamination.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	
41	Section 6.5. The management and disposal of rinse water treated in the treatment unit is not described.	No decon of the treatment unit or concrete will be attempted and Rinse water sampling has been removed.	
42	Section 9. This section says that soil	Revised	Revisions included in Section 4 - Hazardous

	samples will be analyzed for the organic compounds under the hazardous waste codes, identified in Section 3, for which the treatment unit was permitted to treat. Only the waste codes F001, F002, and F005 listed in Section 3 have identified organic hazardous constituents. Waste codes 211 and 213 list some chemical compounds as examples for the waste description, but a complete list of hazardous constituents is not provided. It is not clear why "non-detect" is identified as a Primary Performance Standard if health risk assessment will be applied to any detected organic constituent. The soil analyses and performance standards are only discussed for organic constituents. There are no performance standards for inorganic constituents.		Waste Constituents and Section 8 - Analytical Procedures.
43	Section 9 proposes a risk assessment for organic constituents in soil and an iterative process of removal and subsequent risk assessments until the risk endpoints are within an	Revised	Revisions included in Section 10 – Performance Standards

	acceptable range. The description of this closure by removal process is wholly inadequate.		

Attachment 2 - Boeing Closure Plan Comparison

1995 Closure Plan	Page	2010 Closure Plan	Page
Closure Plan was a single section (Section XIII) of the Groundwater Remediation Operations Plan (GROP)	Pages XIII-1 - XIII-14	Closure Plan has been written as a stand-alone document	Pages i-iii & Pages 1 through 35
Containers and concrete will be tested for the contaminants of concern (COCs) listed in Table XIII-2 for which the GTWUs were designed to treat. The COCs consist of benzene, carbon tetrachloride, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethylene, trans 1,2-dichloroethylene, methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, toluene, vinyl chloride, 2-nitrophenol, phenol, nitrobenzene	XIII-3	COCs for which testing will be conducted are those for which the GWTUs are permitted to treat. These COCs consist of 1,2-dichloroethane, vinyl chloride, tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, 1,1,2-trichloroethane, chlorinated fluorocarbons, xylene, acetone, ethyl acetate, ethyl benzene, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, methanol, toluene, methyl ethyl ketone, isobutanol, benzene, 2-ethoxyethanol, 2-nitropropane and hydrazine	12
Each GWTU will be decontaminated by triple rinsing	XIII-8	No decontamination will be attempted. Wipe samples will be collected of the treatment unit equipment. If results indicate the equipment has been impacted by COCs, it will be managed as hazardous waste-contaminated debris. If it is not impacted by COCs, it wil be managed as non-hazardous.	15-16
The GWTU will remain in operation during decontamination to treat the decontamination rinsewater	XIII-8	The GWTUs are shut down.	N/A

Attachment 2 - Boeing Closure Plan Comparison

1995 Closure Plan	Page	2010 Closure Plan	Page
The exteriors of the GWTUs and containment slabs will be triple rinsed. Rinse water will be pumped to the GWTUs for treatment.	XIII-8	No decontamination will be attempted. Chip samples will be collected of the cotinament systems. If results indicate the concrete has been impacted by COCs, it will be managed as hazardous waste-contaminated debris. If it is not impacted by COCs, it wil be managed as non-hazardous.	17
The interiors of the ASTs, pumps, pipelines and tower packing will be triple rinsed by continuing to flush treated effluent through the system for at least 2 hours after the equipment extriors and containment slab are decontaminated.	XIII-8	No decontamination will be attempted.	15-16
Sodium hexametaphosphate (SHMP) will be consumed in the treatment of the rinsewater	XIII-8	Any remaining SHMP will be disposed of as non-hazardous waste.	16
Unused hydrogen peroxide wil be removed as new material by the supplier	XIII-8	Unused hydrogen peroxide will be moved to the GET system, moved to onsite chemical storage or disposed of as non-hazardous waste	16
Decontamination criteria for clean closure are COCs listed in Table XIII-2 at concentrations using a risk-based evaluation in accordance with the Standardized Risk Assessment Methodology (SRAM) work plan.	XIII-9	Criteria for management of treatment units as non-hazardous is non-detect for COCs listed in Section 4 of the Closure Plan. Criteria for management of concrete containment system as non-hazardous is non-dect for COCs in Section 4 and less than TTLC/STLC/TCLP values for entrained metals.	31
Decontaminated equipment will be sold to a new user or sold as scrap.	XIII-9	Non-impacted equipment, structures and concrete may be sold for scrap or disposed of as non-hazardous waste.	28-30
Two concrete samples wil be collected from each slab (10 samples total)	XIII-10	As many as 34 concrete chip samples will be collected.	20

Attachment 2 - Boeing Closure Plan Comparison

1995 Closure Plan	Page	2010 Closure Plan	Page
No mamximum inventory indicated.	XIII-11	The maximum inventory of hazardous waste and chemical products associated with the treatment systems includes fourteen 55-gallon containers of activated carbon, 220 gallons of SHMP, 380 gallons of chlorine solution, 1,000 gallons of hydrogen peroxide solution and 500 gallons of treated groundwater.	13
Closure Schedule is 100 days	XIII-13	Total elapsed time for closure is anticipated to exceed 300 days. A request for an extention to closure is included as an appendix to the Closure Plan.	33
Sludge in the ASTs is not addressed	N/A	A contingency for 1,000 gallons of sludge per AST (5,000 gallons total) is included in the Closure Cost	Table 11.1
Wipe sampling of equipment is not included	N/A	Wipe sampling of the equipment is included. As many as 80 discretionary wipe samples may be collected.	19
Transport piping is not addressed	N/A	An estimate of 10,400 feet of intact transport piping is addressed in the Closure Plan.	17
AST packing material not specifically addressed	N/A	Cost Estimate includes disposal of 625 cubic feet of Packing Material	Table 11.1
Soil sampling is not included	N/A	Soil samplling is included. As many as 78 soil samples will be collected.	21-23

Attachment 3 - NASA Closure Plan Comparison

1995 Closure Plan	Page	2010 Closure Plan	Page
Closure Plan was a single section (Section XIII) of the Groundwater Remediation Operations Plan (GROP)	Pages XIII-1 - XIII-16	Closure Plan has been written as a stand-alone document	Pages i-iii & Pages 1 through 36
Containers and concrete will be tested for the contaminants of concern (COCs) listed in Table XIII-2 for which the GTWUs were designed to treat. The COCs consist of benzene, carbon tetrachloride, chloroform, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethylene, trans 1,2-dichloroethylene, methylene chloride, tetrachloroethylene, 1,1,1-trichloroethane, trichloroethylene, toluene, vinyl chloride, 2-nitrophenol, phenol, nitrobenzene	XIII-3	COCs for which testing will be conducted are those for which the GWTUs are permitted to treat. These COCs consist of 1,2-dichloroethane, vinyl chloride, tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, 1,1,2-trichloroethane, chlorinated fluorocarbons, xylene, acetone, ethyl acetate, ethyl benzene, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, methanol, toluene, methyl ethyl ketone, isobutanol, benzene, 2-ethoxyethanol, 2-nitropropane and hydrazine	12
Each GWTU will be decontaminated by triple rinsing	XIII-8	No decontamination will be attempted. Wipe samples will be collected of the treatment unit equipment. If results indicate the equipment has been impacted by COCs, it will be managed as hazardous waste-contaminated debris. If it is not impacted by COCs, it wil be managed as non-hazardous.	15-16
The GWTU will remain in operation during decontamination to treat the decontamination rinsewater	XIII-8	The GWTUs are shut down.	N/A

Attachment 3 - NASA Closure Plan Comparison

1995 Closure Plan	Page	2010 Closure Plan	Page
The exteriors of the GWTUs and containment slabs will be triple rinsed. Rinse water will be pumped to the GWTUs for treatment.	XIII-9	No decontamination will be attempted. Chip samples will be collected of the cotinament systems. If results indicate the concrete has been impacted by COCs, it will be managed as hazardous waste-contaminated debris. If it is not impacted by COCs, it wil be managed as non-hazardous.	17
The interiors of the ASTs, pumps, pipelines and tower packing will be triple rinsed by continuing to flush treated effluent through the system for at least 2 hours after the equipment extriors and containment slab are decontaminated.	XIII-9	No decontamination will be attempted.	15-16
Sodium hexametaphosphate (SHMP) will be consumed in the treatment of the rinsewater	XIII-9	Any remaining SHMP will be disposed of as non-hazardous waste.	16
Unused hydrogen peroxide wil be removed as new material by the supplier	XIII-10	Unused hydrogen peroxide will be moved to the GET system, moved to onsite chemical storage or disposed of as non-hazardous waste	16
Decontamination criteria for clean closure are COCs listed in Table XIII-2 at concentrations using a risk-based evaluation in accordance with the Standardized Risk Assessment Methodology (SRAM) work plan.	XIII-9	Criteria for management of treatment units as non-hazardous is non-detect for COCs listed in Section 4 of the Closure Plan. Criteria for management of concrete containment system as non-hazardous is non-dect for COCs in Section 4 and less than TTLC/STLC/TCLP values for entrained metals.	31
Decontaminated equipment will be sold to a new user or sold as scrap.	XIII-13	Non-impacted equipment, structures and concrete may be sold for scrap or disposed of as non-hazardous waste.	28-30
Two concrete samples wil be collected from each slab (10 samples total)	XIII-12	As many as 24 concrete chip samples will be collected.	20

Attachment 3 - NASA Closure Plan Comparison

1995 Closure Plan	Page	2010 Closure Plan	Page
No mamximum inventory indicated.	XIII-13	The maximum inventory of hazardous waste and chemical products associated with the treatment systems includes fifteen 55-gallon containers of activated carbon, four 250-gallon capacity sand filters, 110 gallons of SHMP, 190 gallons of chlorine solution, 300 gallons of hydrogen peroxide solution, 8,000 gallons of untreated groundwater and 8,000 gallons of treated groundwater.	13
Closure Schedule is 100 days	XIII-14	Total elapsed time for closure is anticipated to exceed 300 days. A request for an extention to closure is included as an appendix to the Closure Plan.	34
Sludge in the ASTs is not addressed	N/A	A contingency for 3,000 gallons of sludge is included in the Closure Cost	Table 11.1
Wipe sampling of equipment is not included	N/A	Wipe sampling of the equipment is included. As many as 54 discretionary wipe samples may be collected.	19
Transport piping is not addressed	N/A	An estimate of 1,600 feet of intact transport piping is addressed in the Closure Plan.	17
AST packing material not specifically addressed	N/A	Cost Estimate includes disposal of 540 cubic feet of Packing Material	Table 11.1
Soil sampling is not included	N/A	Soil samplling is included. As many as 48 soil samples will be collected.	21-23